

of time less than 30 seconds;

conveying the preheated material to the inlet of a primary disc refiner operating at a temperature above the glass transition temperature of the lignin; and

refining the material at a disc speed of rotation that is greater than 1500 rpm for a double disc refiner or greater than 1800 rpm for a single disc refiner.

37 The method of claim 36, wherein the conditioning of said feed material is performed for a period of time in the range of 3 - 60 seconds.

REMARKS

As a result of the foregoing amendments, applicant presents a total of 15 claims, consisting of independent claim 29 and associated dependent claim 37; independent claim 31 and associated dependent claims 2, 7, 23, 25, 26, 27, 32, 33, 34, and 35; and independent claim 36 with associated dependent claim 24.

Independent claim 29 includes a new limitation that is self-evident from the embodiments shown in the Figures, i.e., that the described refining systems do not include a chemical digester. Independent claims 31 and 36 find support in now canceled original claims 3 and 5, respectively. The association of the temperature range with the material is supported, for example, on page 3 line 25, and page 21 line 13. Thus, it is possible that the steam temperature in the conditioning and/or compressing environment can be higher than that corresponding to a saturation temperature of 120 deg. C, so long as the duration of exposure of the material does not raise the temperature of the material (particularly the lignin therein) above about 120 deg. C.

The rejection of numerous claims under 35 U.S.C. 112 in the official action dated November 8, 1999 is now moot, because the allegedly unsupported limitations identified by the examiner do not appear in any of the claims as amended.

The present invention is directed to a pretreatment limited to the thermo-mechanical refining context. Independent claim 31 specifically requires that both a preheating step and a refining step follow the inventive pretreatment (e.g., conditioning and compressing). Similarly, independent claim 36 requires that preheating, conveying, and refining steps follow the inventive pretreatment steps. Independent claim 29 does not specifically recite a

preheating step, but does contain a limitation to the effect that the refining follows the pretreatment without intervening chemical digestion. Applicant has previously discussed this context in, for example, the Response filed August 10, 1999, on page 9 line 13 to page 10 line 9, and page 10 line 16 to page 11 line 21.

Although none of the claims as amended stands rejected in the outstanding official action, applicant will as a matter of efficient prosecution, comment on the patentability of these claims relative to the disclosures of the references previously relied upon by the examiner under 35 U.S.C. 102 and 103. Prusas relates to chip treatment upstream of a chemical digestion system; there is no teaching or suggestion of applicability to thermo-mechanical refining. The optional refiner of Prusas following the digester is a low pressure, finishing refiner that is fundamentally different from and cannot be used for generating thermo-mechanical pulp (except as an optional finishing refiner). Applicant acknowledges that Lunan relates only to thermo-mechanical refining. However, in Lunan the high pressure conditions upstream of the refiner are for preheating (at 32-90 psi) and not for the pretreatment upstream of preheating. Applicant's claims that specify a pressure range of 15 - 25 psi further distinguish Lunan.

Applicant refers the examiner to the following points made in the Remarks portion of the Response filed August 10, 1999:

1. The chips as processed by Prusas easily crumble between the fingers, i.e., they are not pliable (see page 13 lines 3 to 22);
2. The chips as pretreated by applicant's invention have a high degree of fiber separation yet remain pliable (see page 13 line 23 to page 15 line 12);
3. Applicant's pretreatment and associated TMP processing provide superior results relative to conventional TMP (see page 15 lines 13 to 23);
4. There is insufficient basis for the examiner to combine the teachings of Prusas and Lunan to reject applicant's claims to a TMP process (see page 17 lines 10 to 21).

For the foregoing reasons, applicant believes all claims as amended are patentable, and allowance of the application is respectfully requested.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "L. James Ristas", is written over a horizontal line.

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